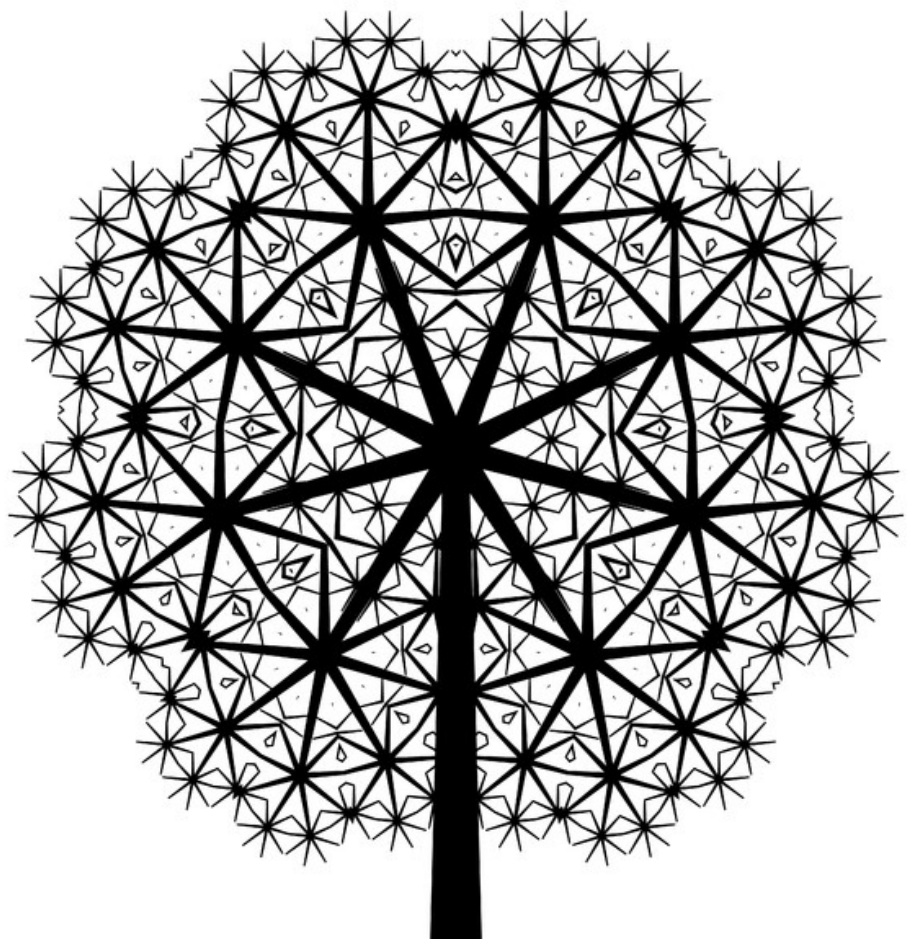


A FRACTAL VIEW OF LEAN

“...OR WHY BROCCOLI IS GOOD FOR YOU!”

JAMES LASCELLES



Based on his Lean Competency System Level 3 Programme submission, this innovative article by James Lascelles provides an illuminating and thought-provoking perspective on lean using fractal thinking. He argues that the approach has several advantages, such as enabling a more rounded definition of lean, helping engender positive team work and engagement and can lead to more effective implementation at different organisational scales.

INTRODUCTION

Some contend that lean is at a tipping point in its life cycle. Will it wither away as just another business improvement fad, or will it thrive, survive and grow and bring its full potential to bear on business, the public sector and society?

This article argues that taking a fractal view of lean will help it take the latter path, enabling it to continue to evolve and help people and organisations improve and prosper.

It first defines fractal and how it relates to lean thinking. It then highlights the potential advantages of this perspective and looks at examples of applying lean at different scales and variations from individual working behaviours to team ways of working to organisational operating models.

It concludes with the practical implications for lean initiatives from taking a fractal perspective.

WHAT IS A FRACTAL VIEW OF LEAN?

The Fractal Foundation defines fractal as:

“a never ending pattern that repeats itself at different scales. This property is called self-similarity. Although fractals are very complex they are made by repeating a simple process.” (Fractal-Foundation, 2015)



It is contended that lean has its own fractal, since the foundational lean concept of **maximising value**

by minimising waste applies at every scale of work, from how individuals handle daily work and activities, through to team ways of working, value stream optimisations and organisational operating models.

A fractal view of lean taps into a familiar theme. Shea Gunther in **Mother Nature Network** states that

“the laws that govern the creation of fractals seem to be found throughout the natural world. Pineapples grow according to fractal laws and ice crystals form in fractal shapes, the same ones that show up in river deltas and the veins of your body. It’s often been said that Mother Nature is a hell of a good designer, and fractals can be thought of as the design principles she follows when putting things together”. (Gunther, 2014)

Broccoli is a natural fractal. The Romanesco variety of Broccoli (illustrated) is the ultimate fractal vegetable and exhibits a repeating pattern that displays at every scale. (McNally, 2008).

ADVANTAGES OF A FRACTAL APPROACH

Taking a fractal view of lean has several advantages:

1. It helps resolve the **confusion between different improvement methodologies**. Lean versus Systems Thinking is an example. A fractal perspective suggests that Systems

Thinking is simply the application of lean principles at the system or operating model level.

2. It **broadens the view of lean** not only in size and scale but also in breadth. Lean thinking

A FRACTAL VIEW OF LEAN

should include any element that can influence the flow of value to the customer: not only process activities but policy, measures and controls, leadership behaviours, skills and structures, daily working culture and technology. Each broccoli has the same design principles but each broccoli has its own unique size and shape. It is the same with lean.

3. It generates exciting **new areas for development** that have received relatively little attention up to now, such as the application of lean thinking at the individual

level.

4. A fractal perspective **supports sustainability** by promoting lean culture and behaviours at every scale in the organisation: from the very big to the very small. From strategic operating model designs, to value stream streamlining and intra-team optimisation. And for leadership behaviours at every level from the board to team managers to individual working habits and behaviours. Fractal lean can become part of the organisational DNA.

BREAKING DOWN BOUNDARIES

The spread of lean thinking over the past three decades has often been characterised by boundaries.

Industry boundaries, such as manufacturing and service; functional boundaries such as finance, IT and operations; other types of boundary, such as the two levels of Strategic and Operational lean, set out in **Learning to Evolve - A Review of Contemporary Lean Thinking** (Hines et al, 2004).

While boundaries have been helpful in charting the spread of lean, it can be argued they have been unhelpful in creating the perception that lean is constrained within these boundaries.

Comments such as 'lean is for transactional not creative processes' or 'lean is good at incremental change, but we need transformational change!' or 'lean works for existing processes but we need completely new processes' or 'lean focuses on tools but we need to focus on culture' are common and suggest the presence of barriers that inhibit lean's broader application.

A fractal view of lean challenges these self-imposed constraints. It suggests that in every sphere of organisational and individual activity, and at every scale and type of issue there are opportunities to apply lean principles to remove waste and improve performance.

THINKING BIG

The following case helps illustrate the application of lean thinking at the operating model scale.

Several years ago a global services company was redesigning its sales, service and delivery model. As with many operating model projects, the primary lens was organisational looking at structures, reporting lines, governance, spans of control, roles and responsibilities.

There was less consideration of the actual work to be delivered, the volumes and variations of work

involved, the types of customer for that work and their requirements.

The new design was completed after several month's intense activity and a global conference call was organised to announce and explain the new operating model.

During the Q&A session the first question was: "how is this new structure going to influence the speed with which we can get new sales proposals approved and out to our customers?"

A FRACTAL VIEW OF LEAN

There was a pause and then the answer from the Project Head: “that’s the very next thing that the design team’s going to look at!”

This was one of the core value streams running through the new structure. Its performance deteriorated as a result of the new operating model.

Sometime after, the same organisation repeated the exercise. This time a lean lens was applied, looking at the core value streams, the customer types and their requirements for each value stream

and the types, volumes and variations of work that were flowing through each value stream. This lean lens resulted in a radical organisational redesign.

Multiple regional centres of excellence were consolidated into two global centres of excellence operating around the clock and with team cells containing the necessary expertise and authority levels to get proposals to customers much faster and with rapid iterative response to specification and budget modifications.

THINKING SMALL

Much of the focus of lean thinking has been on the **system**, the **value stream** and the **team**. But what about each of us as individuals and our daily working habits and practices? Could lean thinking at a personal level be one of the greatest areas of opportunity?

While this is covered to an extent in team based optimisations, using such methods as ‘Day in the Life Of’ (DILO) and ‘Week in the Life Of’ (WILO) these tend to be used at the team abstract level.

Daniel Markovitz explores this area in his book **A Factory of One – Applying Lean Principles to Banish Waste and Improve Your Personal Performance**. (Markovitz, 2011):

“...while lean has enabled companies to make huge gains in how they get things done, there is a new and vast frontier still waiting to be improved: the daily world of individual work ... by applying lean principles to your work, right now, you can reduce the effort and frenzy that characterize your days and get more high quality work done with less stress.”

Markovitz shows with case studies and examples how the principles of value, waste, flow, 5S, visual management, kanban, root cause problem solving and continuous improvement can be applied at the individual level for better results and a more sustainable and balanced way of working.

Although he does not use the lean word, David Allen’s book **Getting Things Done**, (Allen, 2001), proposes a methodology for individuals to improve and optimise how to get things done.

Many have found this methodology helpful in reducing lead and process times and removing waste and re-work from daily activity.

Allen argues that most human beings are ill prepared for the high levels of demand and wide variation of work that hits them on a daily basis. Most have no formal process for handling this demand and simply muddle through, often with large amounts of stress and rework involved.

Allen proposes a clear process to handle work:

“The core process I teach for mastering the art of relaxed and controlled knowledge work is a five-stage method for managing workflow. No matter what the setting, there are five discrete stages that we go through as we deal with our work.

We (1) collect things that command our attention; (2) process what they mean and what to do about them; and (3) organize the results, which we (4) review as options for what we choose to (5) do.”

He also proposes a series of rules to minimise lead and process times. A good example is the **three-minute rule**: if you can do something in less than three minutes then do it right away, otherwise write it down and avoid the rework of constantly trying to remember multiple items.

THINKING FRACTALS

Taking a fractal view of lean can provide a helpful framework for applying lean thinking at different scales.

Organisation

The organisation itself can be considered a **lean fractal**. This fractal is particularly important as it provides the environment in which other lean fractals will flourish or wither. Elements such as customer focus, leadership behaviours, skills development, structures, measures and rewards need to be designed and aligned to provide a supportive environment.

Value stream

A primary lean fractal is the Value Stream. This fractal includes all the steps and activities, usually involving multiple functions, required to flow value of a specific product or service to a customer.

This fractal is highlighted by Womack and Jones in **Lean Thinking** in the second and third of their five principles of lean thinking: “2. Identify the entire value stream and 3. Make the value-creating steps for specific products flow continuously.” Many of the key lean tools are specifically targeted at this fractal such as Value Stream Mapping and lead time reduction.

Teams

Teams are a high potential fractal. Teams can apply lean thinking to many areas of their work that are within their gift to improve and at little or

no cost.

These include understanding who their customers are – external and internal – and what they want; monitoring and handling incoming demand volumes and variations; up skilling, cross skilling and capacity balancing to handle demand; root cause problem solving and visual management.

These lean practices typically cost less, rather than more, and generate significant wins in productivity and quality. They simply represent a more intelligent way for teams to work, to self-organise and self-optimize.

Another helpful fractal is **inter-team improvements** between two teams. Many business issues and, conversely, opportunities for improvement, lie in the poor interaction between two teams.

Sales think that credit is too slow and risk averse. Credit thinks that sales put revenue ahead of profitability. Business teams complain that IT takes too long to deliver new applications. IT complains that the business cannot say what it really wants.

Two highly effective lean methods for inter-team problem resolution are **Kaizen workouts** and **A3 root cause problem solving**. Both represent a rapid and structured approach to mobilising the right multi-function change team, understanding the root causes of problems, and developing and implementing appropriate solutions.

PRACTICAL IMPLICATIONS OF A FRACTAL VIEW OF LEAN

For an organisation deciding to take a fractal view of lean the implications are practical and potentially far reaching.

Consider Broccoli again: Every bud is involved in making the whole. In other words, a fractal view of lean suggests that everyone is involved. There is no

part of the organisation that is outside or excluded from the fractal.

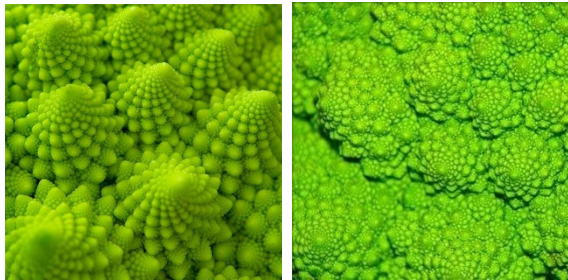
Engagement

A simple way to **engage everyone** is to propose that every member of the organisation becomes, at the minimum, lean aware and familiar with the

A FRACTAL VIEW OF LEAN

basic concepts of customer purpose, value versus non-value work, waste and flow.

Zooming in ... Zooming out...



For example, the Lean Competency System (LCS) Level 1A certification is a good way to enable and track this objective. This can be accomplished through a short training course, often using a fun simulation such as the Lego Game, or there are short lean eLearning courses available that give Level 1A Accreditation on passing an on-line exam at the end of the course.

As well as developing learning, the external LCS accreditation and the recognition involved generates positive people engagement.

Leadership

A fractal view of lean also suggests that leaders at every level need to know their part in creating a **culture of continuous improvement**. This can start with a one day lean leadership course which teaches simple behaviours that have immediate impact.

For example, joining daily team huddles to understand what's happening on the ground; asking direct reports "what waste am I driving and what can I do differently to remove it?" and sponsoring the use of A3's and root cause problem solving as everyday habitual ways to resolve issues.

In the words of one COO, "we want to create a culture where not everything has to be a project to get fixed!"

Enterprise wide

A fractal view of lean supports the notion that **every part and level of the organisation** can benefit from lean thinking. This can be particularly

helpful for functions that have typically fallen outside lean focus areas, such as legal services or compliance.

These functions tend to see their work as so specialist that lean cannot be applied. Yet the benefits can be significant. Legal and compliance activities are usually part of, and influence, multiple core value streams such as sales, services and customer on-boarding.

Having these specialist areas understands who their customers are, internal and external, what they want, the volumes and variations of work involved and how to process and capacity balance as effectively as possible can be a great competitive advantage, as well as making work a lot less stressful for everyone involved.

Individual level

A fractal view of lean promotes a new focus on each of us as individuals. How can lean thinking help us improve and enhance our **personal ways of working**?

No one enjoys the constant stress, juggling acts and overcapacity that are part of today's working landscape; lean, surely, can help and it may also be that focusing at the individual level can have a profound impact at the system level.

Consider this case. In a workshop for the Lean Centre of Excellence for a global energy company, a plan for deployment of lean across the organisation was being developed.

One member of the team remarked: "you know what would make the biggest difference of all – and it's not even on the plan: if we just had a culture of people doing what they said they would do!"

There was a powerful simplicity in this observation and it was evident that there was considerable waste and cost in accepting this behaviour as the cultural norm.

For example, non-value adding meeting time, missed plans and unpredictable performance. While those present agreed with the sentiment, it was not addressed in the plans. The lean

A FRACTAL VIEW OF LEAN

perspective was too focused on value streams and teams to be able to adapt to this more personal and individual form of waste. A fractal view of lean, arguably, could have helped in this situation.

Issue resolution & problem solving

A fractal view of lean would promote the use of a range of **simple improvement roadmaps** that people can use to address different types of business issues: resolving issues within the team; enabling two teams to work better together; dealing with a short sharp tactical problem; streamlining a value stream of activities across multiple functions.

The power of these roadmaps is not that they are the perfect way or even the mandated way – but that they are a standard starting point for people to use and adapt to resolve problems as fast and effectively as possible.

People can decide how to and where to drive the improvement train, but they don't have to build the railway tracks each time!

This idea is developed by Ravindranath Pandian in **A Simple Path to Excellence: A Body of Knowledge** (Pandian, 2016). Pandian simplifies improvement to the two categories of **Thinking** and **Doing**. Within each category are Books of Knowledge or BoKs.

For example, within the Doing category are three BoKs for addressing Simple Problems, Well Defined Problems and Ill Defined Problems. Pandian proposes the concept of **Excellence Fractals**:

“Each BoK composition would serve as a fractal, a scaled version of the total. The fractal composition of BoK can dramatically vary in depth, breadth and complexity. Our suggestion is to use the most minimal composition to address a give environment. The gaps, if any, can be eminently filled intuitively by human agents, the unseen force in this BoK.

Instead of prescribing comprehensive tools for every circumstance, this BoK seeks to provide directions for every problem environment. Human agents are waiting for directions and can synthesise their own tools.” (Pandian, 2016)

SUMMARY

Just as the broccoli is a never ending pattern repeating itself at different scales so a fractal view of lean involves everyone in the organisation creating a culture of continuous improvement at every scale.

A fractal view of lean brings together and make sense of the multiple flavours of improvement methodologies.

Although it is made by repeating a simple process, Romanesco broccoli is actually very complex

containing no fewer than four vitamins and twelve elements including manganese, calcium and selenium.

Likewise however many elements form part of a fractal lean culture, the underlying process is very simple: to continually and repeatedly flow more value for less resource.

Fractal lean, like the Romanesco broccoli, can be endlessly nourishing, nutritious and healthy at every level.

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